1: Am J Physiol. 1995 May;268(5 Pt 2):H1869-74.

ANP secretion from small cell lung cancer cell lines: a potential model of ANP release.

Wigle DA, Campling BG, Sarda IR, Shin SH, Watson JD, Frater Y, Flyr TG, Pang SC.

Department of Anatomy and Cell Biology, Queen's University, Kingston, Ontario, Canada.

Although atrial distension is widely accepted as the primary stimulus for atri natriuretic peptide (ANP) release, a number of agonists are also known to inc its secretion. The mechanisms underlying these processes are not well understood. Studies of this nature are hampered by the inherent difficulty in culturing homogeneous populations of cardiac myocytes in sufficient quantit to perform molecular investigations. For this reason, we have examined the possibility of using other cell types as a model of ANP release. It has been reported that a number of tumor samples from small cell lung cancer (SCLC) patients express the ANP gene. Characterization of a large number of cell lin derived from SCLC tumor samples indicated that two of these cell lines, OS- and SHP-77, secrete ANP at rates of approximately 10(-20) g.cell-1.min-1. T is a sufficient quantity to facilitate secretion studies using a perifusion systen We have demonstrated that ANP is released through regulated secretory pathways, as the Ca2+ ionophore A-23187, arginine vasopressin (AVP), and sodium ionophore, monensin, were capable of modifying secretion rates. Hig pressure liquid chromatography (HPLC) analysis indicated that the primary secretory product is ANP-(99-126), the circulating form of this hormone. Intracellularly, both ANP-(99-126) and ANP-(1-126) were present, suggestir the synthesis and appropriate cleavage of pro-ANP-(1-126). Because both of these cell lines have doubling times in the range of 3-5 days, they could serv a rapidly proliferating and easily maintainable supply of homogeneous tissue release studies.(ABSTRACT TRUNCATED AT 250 WORDS)

PMID: 7771538 [PubMed - indexed for MEDLINE]

1: Cancer Res. 1993 Jul 1;53(13):3165-71.

Related Articles,

Human small cell lung cancer cell lines express functional atrial natriuretic peptide receptors.

Ohsaki Y, Yang HK, Le PT, Jensen RT, Johnson BE.

National Cancer Institute-Navy Medical Oncology Branch, National Naval Medical Center, Bethesda, Maryland 20889-5105.

Small cell lung cancer cell (SCLC) lines, NCI-H82, NCI-H660, and NCI-H1 and HeLa cells were analyzed for the presence of atrial natriuretic peptide (A receptors. In these SCLC cell lines and HeLa cells, ANP A receptor mRNA v identified by Southern blot analyses of polymerase chain reaction products a RNase protection assays using poly(A)(+)-selected RNA. Saturable binding assays revealed that HeLa cells had 2000 to 5000 high affinity atrial natriure peptide receptors per cell with a dissociation constant of 140 pM. In the SCL cell lines, the binding was saturable but too low to accurately estimate the number of binding sites. After addition of human ANP, radioimmunoassays revealed accumulation of cyclic GMP in SCLC cells as well as HeLa cells in dose-dependent fashion. The half-maximal stimulation concentration of cycli GMP accumulation in HeLa and these SCLC cell lines was approximately 2 Tetrazolyl blue assays and tritiated thymidine incorporation did not show any remarkable growth inhibition or growth stimulation of SCLC cell lines after addition of human ANP up to 3.3 microM, more than 1000-fold greater than half-maximal stimulation concentration of cyclic GMP accumulation. Our re indicate that human SCLC cells express functional ANP receptors but ANP addition produced no detectable change in their growth pattern.

PMID: 8391389 [PubMed - indexed for MEDLINE]